Space Weather Forecast

Issued on Monday 24 March 2025 at 13:14 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic storms throughout., with increasing probability by days 3 and 4 (26 and 27 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the past 24 hours, with occasional Common-class flares. There are seven sunspots on the Earth facing solar disc, the vast majority of which are relatively small and magnetically simple and either stable or in slight decay. A region in the northwest quadrant remains the largest group, and appears magnetically simple.

No Earth-directed Coronal Mass Ejections (CME) were observed leaving the Sun during the 24 hour period.

Solar Wind / Geomagnetic Activity: Solar winds have been at Low to slightly elevated levels throughout. Interplanetary Magnetic Field was weak until the late arrival of an anticipated CME that left the sun on 21Mar with mostly Moderate levels observed for around 9 hours after 24/0000 UTC. The north-south component was also weak until the CME arrival when Moderate elevels were also recorded.. Geomagnetic activity was Quiet to Active throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is expected, with a slight chance of isolated M-class flares over the next four days.

Solar Wind / Geomagnetic Activity: A faint halo coronal mass ejection was observed at 21/1558 UTC. This was initially forecast to arrive at Earth during 23 Mar, but may have been slower with an arrival early on 24 Mar. There is a second coronal mass ejection, originating around 22/1400 UTC, which is of lower confidence. This may also be affecting Earth during Day 1 (24 Mar). Solar winds at low or slightly elevated levels probably reaching elevated to strong levels due to the arrival of a coronal hole fast wind from late Day 2 or early Day 3 (26 Mar) onwards.

Quiet to Unsettled geomagnetic conditions with an increasing Chance of Active to Minor storming following the CME arrival on Day 1 (24 Mar). There is a further chance of Minor storms from late

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Day 2 (25 Mar) onwards due to the arrival of the HSS from the coronal hole, and there is a likelihood of geomagentic storms to end the guidance period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with a slight chance of enhancement from any larger flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	50	40	70	60
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	No	15	10	5	10
Very Active	**R3-R5 (X Class)**	No	1	1	1	1

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	1	1
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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